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NOTES ON GEOGRAPHIC DISTRIBUTION

Fish, Characiformes, Characidae, *Astyanax turmalinensis* Triques, Vono and Caiafa, 2003: Distribution Extension

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ABSTRACT: *Astyanax turmalinensis* was described from upper Jequitinhonha River basin and this note extends the species distribution to two adjacent drainages, the São Francisco and the Doce River basins, in the Parque Nacional da Serra do Cipó.

Astyanax turmalinensis Triques, Vono and Caiafa, 2003, was described from upper Jequitinhonha River basin, the type locality being the Divisão stream, right bank tributary of Jequitinhonha River, at Peixe-Cru village, municipality of Turmalina, state of Minas Gerais, Brazil. The Serra do Cipó comprises part of Espinhaço Mountain Chain in central Minas Gerais state. The Cipó River gives name to the Parque Nacional da Serra do Cipó (Serra do Cipó National Park) and is a right bank tributary of Velhas' River, which is a right bank tributary of São Francisco River. The first inventory of the fish fauna of the Parque Nacional da Serra do Cipó (from now on mentioned as PNSC) was done by Vieira *et al.* (2005), including a map of the area and a list with 48 species. Triques (2006) included two other species in the PNSC list of fish species. We have collected specimens of *Astyanax* (Figure 1) from both São Francisco River and Doce River basins (Figure 2) inside the PNSC, not previously identified to species level, and a detailed morphological study indicated that they belong to *Astyanax turmalinensis*.

FIGURE 1. Lateral view of *Astyanax turmalinensis*, DZUFMG 024, 43.1 mm SL.

The collected specimens were fixed in 10 % formalin in the field and kept in 70° GL (Gay-Lussac graduation) alcohol in laboratory, under the acronym DZUFMG (Departamento de Zoologia da Universidade Federal de Minas Gerais). The morphological study includes measurements, counts and skeletal features. Some specimens were cleared and stained for bone and cartilage as in Taylor and Van Dyke (1985) and dissected as in Weitzman (1974). Comparison of these specimens was done with the pertinent literature (Eigenmann 1921; Gery 1977; Triques *et al.*. 2003), with specimens of the type series, including the holotype, of *A. turmalinensis* and with specimens of the similar *A. intermedius* and the sympatric *A. rivularis*. Measurements were taken point-to-point with a needle caliper to tenth of millimeter and include (1) standard length; (2) greatest body depth; (3) head length; (4) the least caudal-peduncle depth; (5) predorsal length; (6) dorsal-fin base; (7) dorsal-fin length; (8) preadipose length; (9) preanal length; (10) anal-fin length; (11) anal-fin base; (12) prepelvic length; (13) pelvic-fin length; (14) prepectoral length; (15) pectoral-fin length; (16) dorsal-adipose length; (17) dorsal-caudal length; (18) greatest head depth; (19) snout length; (20) horizontal orbital diameter; (21) interorbital length; (22) dorsal-pectoral length; (23) dorsal-anal length and (24) anal-adipose length. Meristic data were: (1) number of lateral-line scales; (2) number of scale rows above lateral line, in a vertical through dorsal-fin origin, including the mid-dorsal scale; (3) number of scale rows below lateral line, through the pelvic-fin origin, including the mid-ventral scale; (4) dorsal-fin rays; (5) pectoral-fin rays; (6) pelvic-fin rays; (7) anal-fin rays; (8) dorsal lobe rays of caudal fin; (9) ventral lobe rays of caudal fin; (10) numbers of teeth of premaxillary outer and inner series; (11) number of maxillary teeth; (12) number of large teeth of dentary. Body measurements were transformed into percentages of standard length and cephalic measurements were transformed into percentages of head length. Data on color pattern, head and body profile, qualitative external

head and body morphology, were taken directly from the specimens, with or without the help of stereomicroscope. No differences were found between type material of *A. turmalinensis* and the specimens from São Francisco and Doce River basins.

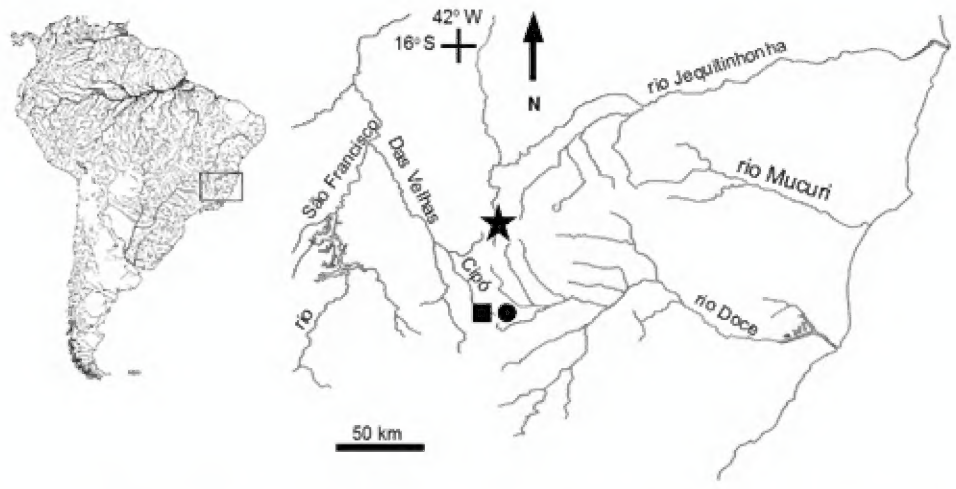

FIGURE 2. Distribution of *Astyanax turmalinensis*: type locality (star) at the Jequitinhonha River basin and the new discoveries at São Francisco River (square) and Doce River basins (circle). Redrawn, enlarged and simplified from Rider's Digest Brasil (1999). Only the main tributaries, concerning to *A. turmalinensis* distribution, were represented. Reduced map of South American drainages, showing detailed area of occurrence of *Astyanax turmalinensis*, originally prepared by Dra. Marilyn Weitzman.

Specimens of *A. turmalinensis* collected in PNSC are listed subsequently, including acronym and number; number of specimens in parentheses, collecting site and date; all of them from Serra do Cipó in the PNSC, collected by the second author, except whenever noted; cleared and stained specimens indicated as C&S. DZUFMG 018 (08), Rio do Peixe, bacia do Rio Doce, 19°20'15" S, 43°31'10" W, April 28, 2001. DZUFMG 019 (01, C&S), Rio do Peixe, bacia do Rio Doce, 19°20'15" S, 43°31'10" W, April 28, 2001. DZUFMG 020 (01, C&S), same data as the previous. DZUFMG 021 (11), córrego Capão da Mata, bacia do Rio São Francisco, 19°19'15" S, 43°32'9" W, May 1, 2001. DZUFMG 022 (01 C&S), same data as the previous. DZUFMG 023 (01 C&S), same data as the previous. DZUFMG 024 (46), same data as the previous, except by date October 18, 2002. DZUFMG 025 (22), Rio do Peixe, bacia do Rio Doce, 19°20'15" S, 43°31'10" W, October 19, 2002. DZUFMG 026 (06), Ribeirão Mascates (Mascote?), tributary of Rio Cipó, November 25, 2000, collected by the first author. *Astyanax rivularis* (Lütken, 1875) was collected together with DZUFMG 026, but numbered as 027 (48), and a diagnosis from *A. turmalinensis* is presented subsequently. Initially, the specimens were identified as *A. intermedius* Eigenmann, 1908, with the use of the key of Eigenmann (1921) and a detailed comparison was implemented by the study of MZUSP 16708 (10 of 1317 specimens), MZUSP 43830 (10 of 109) and MZUSP (5 of 37) all from Paraíba do Sul River basin, where the type locality is. A new diagnosis from this species is presented subsequently. Cleared and stained non-type material of *A. turmalinensis* are DZUFMG 017 (11; originally DZUFMG 016).

Comparison with other species were done after we discovered mistakes in Triques *et al.* (2003: 148, Table 1): head depth not 79.1–101.3 % of head length; in fact 94.6–110.1 %; inner series of teeth of premaxillary may have 4-5, not only 4 as in Triques *et al.* (2003).

Astyanax turmalinensis differs from *A. rivularis* by (1) greatest body depth in a vertical through pelvic-fin origin (*vs.* in a vertical through the middle, up to the tip of pectoral fin, in *A. rivularis*); (2) origin of pectoral fin in a vertical through posterior bony border of opercle (*vs.* origin of pectoral fin nearly through the middle of bony opercle in *A. rivularis*); (3) clear area behind humeral spot with chromatophores restricted to posterior margins of scales (*vs.* not restricted to posterior borders of scales in *A. rivularis*) and (4) presence of a diffuse dark spot vertically elongated, placed behind the clear area posterior of humeral spot (*vs.* absence of this diffuse dark spot in *A. rivularis*).

Astyanax turmalinensis differs from *A. intermedius* by (1) eye diameter 27.4–38.8 % of head length (*vs.* 40.6–50.5 % in *A. intermedius*); (2) greatest body depth in a vertical through pelvic-fin origin (*vs.* greatest body depth in a vertical nearly through the pectoral-fin tip *A. intermedius*); (3) snout longer than eye diameter in larger specimens (*vs.* snout shorter than eye diameter in *A. intermedius*); (4) body chromatophores concentrated on the posterior scale borders (vs. uniformly distributed in *A. intermedius*).

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